ARCADIS Design & Consultancy for natural and built assets

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ENVIRONMENT

Subject:
January to June 2019 Semi-Annual Progress Report
Northrop Grumman Systems Corporation
Operable Unit 3 (OU3), NYSDEC Site ID # 1-30-003A,
Bethpage, New York

Date:
July 10, 2019

Contact:
Arnas Nemickas

Phone:
631.391.5212

Email:
arnas.nemickas@arcadis.com

Our ref:
NYNG2019.32TM.LARA5

Dear Jason:

In accordance with Section III of Administrative Order on Consent (AOC) Index # W1-0018-04-01, and the May 2011 Work Plan for Modification of AOC Progress Report (work plan), this letter report describes OU3 activities performed by Northrop Grumman Systems Corporation (Northrop Grumman) from January through June 2019. Activities planned for July through December 2019 are also summarized. In accordance with the approved work plan, these reports will be submitted to the NYSDEC on a semi-annual basis until it is determined that the reports are no longer necessary. The site plan showing well locations is provided on **Figure 1**.

OU3 ACTIVITIES CONDUCTED DURING JANUARY THROUGH JUNE 2019

Bethpage Park Soil Gas Containment System (Formerly Soil Gas IRM)

- Continued Operation, Maintenance, and Monitoring (OM&M) of the Bethpage Park Soil Gas Containment System (BPSGCS)
- Submitted the BPSGCS 2018 Annual and First Quarter 2019 OM&M Reports (March and May 2019, respectively) to the NYSDEC

- The BPSGCS had no significant shutdowns for the January through end of June 2019 period.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS)
- Submitted BPGWCS 2018 Annual and First Quarter 2019 Quarterly OM&M Reports (March and May 2019, respectively) to the NYSDEC
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - January 2019 – One day of downtime was recorded due to scheduled service for a valve replacement.
    - February 2019 – One day of downtime was recorded due to control system updates.
    - April 2019 – One day of downtime was recorded due to quarterly maintenance.
    - June 7-18, 2019 – Twelve days of reduced flow were recorded due to RW-2 pump failure. The RW-2 pump was replaced on June 18 and was back online by 10 AM.

Other

- Performed quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4 January through June 2019. Validated analytical results obtained from the January through June 2019 period are provided in **Table 1**.
- Arcadis is working with a subcontractor on specifying and assembling a replacement dedicated sampling system, consisting of dedicated submersible pump and packer to replace the malfunctioning pump that was removed from Monitoring Well MW116-5 in December 2018. Installation of the replacement sampling system is tentatively scheduled for early September 2019. Monthly sampling of Monitoring Well MW116-5 will resume after the installation.

OU3 ACTIVITIES SCHEDULED DURING JULY THROUGH DECEMBER 2019

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS
- Submit the OU3 BPGWCS Second and Third Quarter 2019 Reports (August and November 2019, respectively) to the NYSDEC

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS

- Submit the OU3 BPGWCS Second and Third Quarter 2019 Reports (August and November 2019, respectively) to the NYSDEC

- Perform annual monitoring round for BPGWCS system in July 2019

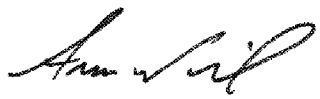
Other

- Perform quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4. Perform monthly monitoring rounds for Monitoring Well MW116-5 after replacement sampling system is installed.

Feel free to call us if you have any questions.

Sincerely,

Arcadis of New York, Inc.



Arnas Nemickas
Senior Hydrogeologist/ Project Manager

Copies:
S. Karpinski – NYSDOH
D. Hesler – NYSDEC
W. Parrish - NYSDEC
E. Hannon, Northrop Grumman
F. Weber, Northrop Grumman
C. Henry, EMAGIN
C. Stein – USEPA
Bethpage Public Library – Public Repository
C. San Giovanni, Arcadis
D. Stern, Arcadis
File, Arcadis

Enclosures:

Table

1 Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells

Figure

1 Site Plan Showing OU3 Well Locations

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman Systems Corporation,
Bethpage, New York.

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Constituents (units in ug/L)	Location ID / Sample Date:	MW-109-3 2/4/2019	MW-109-3 5/29/2019		MW-111-4 2/4/2019	MW-111-4 5/29/2019
1,1,1-Trichloroethane		< 1.0	< 1.0		< 5.0	< 10
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0		< 5.0	< 10
1,1,2-Trichloroethane		< 1.0	< 1.0		< 5.0	< 10
1,1-Dichloroethane		**1.9**	**2.3**		**7.6**	**9.2 J**
1,1-Dichloroethene		**0.64 J**	**0.60 J**		**5.4**	< 10
1,2-Dichloroethane		**0.82 J**	**0.88 J**		**2.7 J**	< 10
1,2-Dichloropropane		< 1.0	< 1.0		< 5.0	< 10
1,3-Butadiene		< 1.0	< 5.0		< 5.0	< 50
1-chloro-1,1-difluoroethane		--	< 5.0		--	< 50
2-Butanone		< 5.0	< 10		< 25	< 100
2-Hexanone		< 5.0	< 5.0		< 25	< 50
4-methyl-2-pentanone		< 5.0	< 5.0		< 25	< 50
Acetone		< 5.0	< 10		< 25	< 100
Benzene		< 1.0	< 0.50		< 5.0	< 5.0
Bromodichloromethane		< 1.0	< 1.0		< 5.0	< 10
Bromoform		< 1.0	< 1.0		< 5.0	< 10
Bromomethane		< 1.0	< 2.0		< 5.0	< 20
Carbon Disulfide		< 1.0	< 2.0		< 5.0	< 20
Carbon Tetrachloride		< 1.0	< 1.0		< 5.0	< 10
Chlorobenzene		< 1.0	< 1.0		< 5.0	< 10
Chlorodifluoromethane (Freon 22)		--	< 5.0		--	< 50
Chloroethane		< 1.0	< 1.0		< 5.0	< 10
Chloroform		**4.4**	**4.9**		**2.6 J**	< 10
Chloromethane		< 1.0	< 1.0		< 5.0	< 10
cis-1,2-dichloroethene		**150**	**164**		**660**	**718**
cis-1,3-dichloropropene		< 1.0	< 1.0		< 5.0	< 10
Dibromochloromethane		< 1.0	< 1.0		< 5.0	< 10
Dichlorodifluoromethane (Freon 12)		**1.1**	**< 2.0**		< 5.0	< 20
Ethylbenzene		< 1.0	< 1.0		< 5.0	< 10
Methyl tert-Butyl Ether		**0.55 J**	--		< 5.0	---
Methylene Chloride		< 1.0	< 2.0		< 5.0	< 20
Styrene		< 1.0	< 1.0		< 5.0	< 10
Tetrachloroethene		**1.7**	**1.3**		**6.6**	< 10
Toluene		< 1.0	< 1.0		< 5.0	< 10
trans-1,2-dichloroethene		**0.65 J**	**1.0**		**2.1 J**	< 10
trans-1,3-dichloropropene		< 1.0	< 1.0		< 5.0	< 10
Trichloroethylene		**270**	**241**		**1200**	**1280**
Trichlorofluoromethane (CFC-11)		< 1.0	--		< 5.0	---
Trichlorotrifluoroethane (Freon 113)		< 1.0	< 5.0		< 5.0	< 50
Vinyl Chloride		< 1.0	< 1.0		< 5.0	< 10
Xylene-o		< 1.0	< 1.0		< 5.0	< 10
Xylenes - m,p		< 1.0	< 1.0		< 5.0	< 10
TVOCs		**430**	**420**		**1900**	**2000**
1,4-Dioxane		**5.1**	**3.7**		**20**	**18**

Notes and Abbreviations on last page.

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman Systems Corporation,
Bethpage, New York.

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Notes and Abbreviations:

Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).

Samples analyzed for TCL VOCs using EPA Method 8260C.

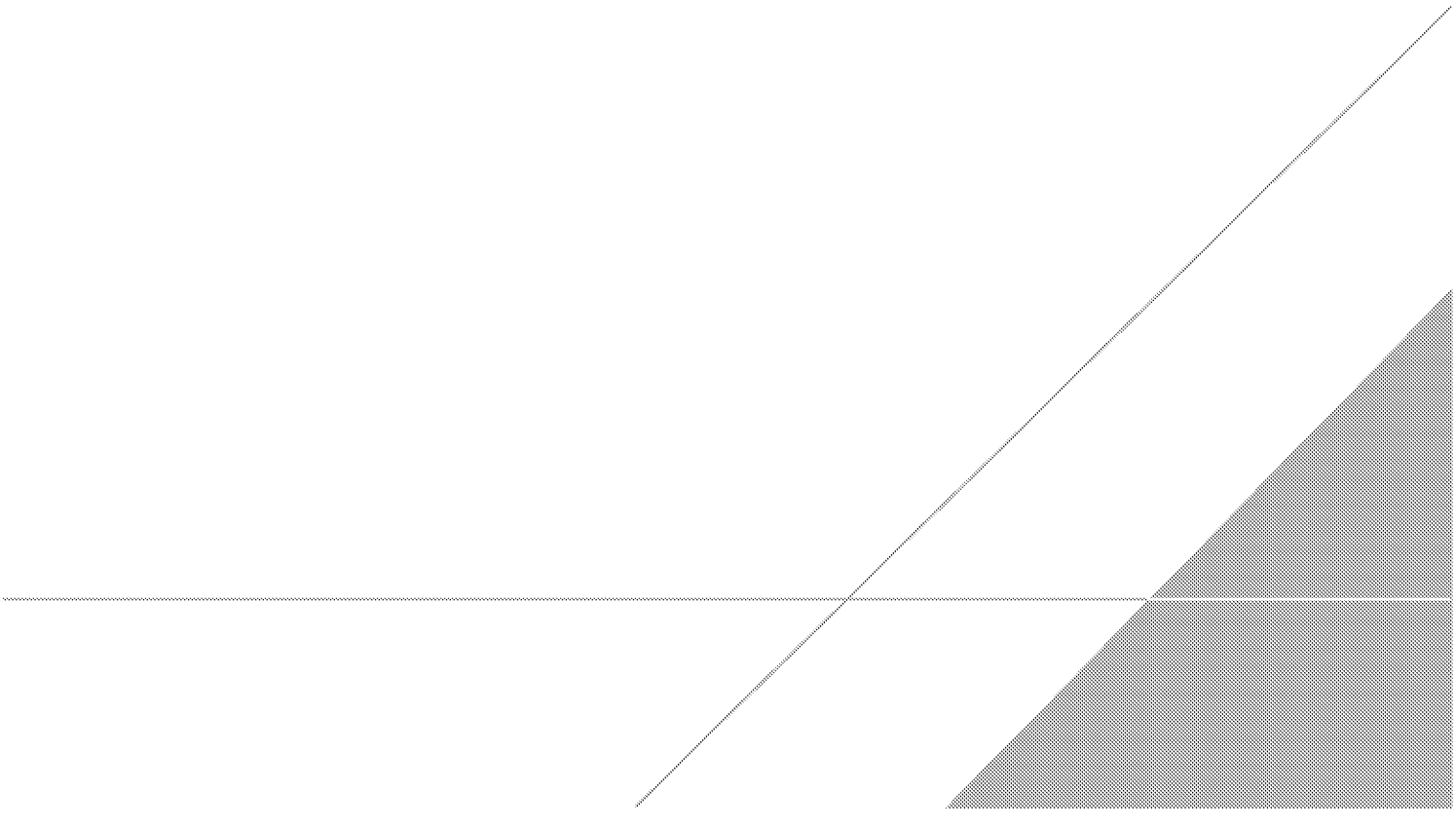
Samples analyzed for 1,4-Dioxane using USEPA Method 8270D SIM.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Target compound list
VOC	Volatile Organic Compound
TVOC	Total Volatile Organic Compounds
ug/L	Micrograms per liter
J	Value is estimated
--	Not Analyzed

FIGURES



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XREFS: IMAGES: PROJECTNAME: ----
Xr1496Xsp
Xr1496X01
XrBDR-EP

B24MW-2
BCPMW-1
B30MW-1
BCPMW-5-1
BCPMW-3
RW-2
BCPMW-6-1
BCPMW-2
RW-1
RW-3
BCPMW-6-2
B24MW-3
BCPMW-7-1
BCPMW-4-1
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RW-21_MW-16
MW-117-5
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BWD 4-2 N-6916
RW-21_MW-14
RW-21_MW-15
MW-118-5
RW-21_MW-13
BWD 5-1 N-8004

PLANT 3
PLANT 2
PLANT 1
PLANT 12
PLANT 12A
PLANT 10
PLANT 28
PLANT 5
PLANT 30
PLANT 37
PLANT 40
BETHPAGE HIGH SCHOOL
BOCES

BROADWAY
GRUMMAN ROAD
BLOOMINGDALE ROAD
CENTRAL AVENUE
LONG ISLAND RAILROAD
NORTH WANTAGH AVE.
HICKSVILLE ROAD
STEWART AVENUE
SEAFORD - OYSTER BAY EXPRESSWAY
BETHPAGE STATE PARKWAY
LOWLAND ROAD
HEMPSTEAD TURNPIKE
RANCH LANE
BOUNDARY AVENUE

EXPLANATION:

FORMER NORTHROP GRUMMAN PROPERTY BOUNDARY

FORMER OCCIDENTAL CHEMICAL CORPORATION PROPERTY BOUNDARY

NORTHROP GRUMMAN PROPERTY

FORMER NAVAL WEAPONS INDUSTRIAL RESERVE PLANT

MONITORING WELL

REMEDIAL WELL

INJECTION WELL

PUBLIC SUPPLY WELL

NAVY AND BETHPAGE WELLS SHOWN FOR REFERENCE PURPOSES

0 500' 1000' 2000'
APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

SITE PLAN
SHOWING OU3 WELL LOCATIONS

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FIGURE
1